Amendments to the Claims

The following listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Previously presented) A method for determining a response to administration of a cancer chemotherapeutic agent to an individual, comprising:

(a) collecting a first tissue or cell sample from the individual before exposing the individual to the cancer chemotherapeutic agent;

(b) collecting a second tissue or cell sample from the individual after exposing the individual to the cancer chemotherapeutic agent;

(c) staining the first and second tissue or cell samples with one or a multiplicity of stains to determine senescence-associated β-Gal (SA β-Gal) activity, p21 expression, or both SA β-Gal activity and p21 expression;

(d) measuring the optical density of the stained tissue or cell samples in step (c), wherein the stained tissue or cell samples are illuminated with light having a wavelength absorbed by the one or a multiplicity of stains;

determining whether SA β-Gal activity, expression of p21, or both SA β-Gal activity and expression of p21 was increased following exposure to the cancer chemotherapeutic agent.

2. (Previously presented) The method of claim 7, wherein the detectable label is a chromagen or a fluorophore.

3. (Canceled).

4. (Previously presented) The method of claim 1, wherein the p21 expression is determined by ELISA assay.

5. (Previously presented) The method of claim 1, wherein optical density of the stained tissue or cell samples is measured by image analysis.

6. (Previously presented) The method of claim 5, wherein image analysis is performed by splitting a signal comprising the optical density of stained cells in the tissue or cell samples into a multiplicity of signals that are processed using optical filters having different absorption and transmittance properties, so that each signal is specific for the one or the multiplicity of stains used to stain the tissue or cell samples.

7. (Previously presented) The method of claim 1, wherein the p21 expression is determined with a detectably labeled antibody.

8. (Previously presented) The method of claim 1, wherein the tissue or cell samples are breast cancer tissue or cell samples.

9. (Currently amended) The method of claim 1, wherein the chemotherapeutic agent comprises ~~a topoisomerase II inhibitor~~ doxorubicin, trastuzamab (HERCEPTIN™), or paclitaxel (TAXOL™).

10. (Canceled).

11. (Currently amended) The method of claim ~~1~~ 9, wherein the chemotherapeutic agent comprises doxorubicin.

12. (Currently amended) A method for determining a response to administration of ~~a topoisomerase II inhibitor~~ doxorubicin to an individual having breast cancer, comprising:

(a) collecting a first tissue or cell sample from a breast cancer of an individual before exposing the individual to ~~a topoisomerase II inhibitor~~ doxorubicin;

(b) collecting a second tissue sample from a breast cancer of an individual after exposing the individual to ~~the topoisomerase II inhibitor~~ doxorubicin;

(c) detecting in the first and second tissue or cell samples SA β-Gal activity, p21 expression, p27 expression, p16 expression or any combination thereof;

(d) determining whether SA β-Gal activity, p21 expression, p27 expression, p16 expression or any combination thereof was increased following exposure to ~~the topoisomerase II inhibitor~~ doxorubicin.

13. (Canceled).

14. (Currently amended) The method of claim ~~13~~ 12, wherein SA β-Gal activity, p21 expression, or a combination thereof is detected.

15. (Previously presented) The method of claim 12, wherein detecting comprises staining the first and second tissue or cell samples for SA β-Gal activity, p21 expression, p27 expression, p16 expression or any combination thereof, and measuring the optical density of one or more stained cells in the stained tissue or cell samples.

16. (Previously presented) The method of claim 15, wherein the optical density of the one or more stained cells is measured by image analysis.